

### North American trees

Three years ago this journal<sup>5</sup> noticed the appearance of SARGENT'S excellent *Manual of the trees of North America*, which brings into a convenient volume the information that is much more elaborated in his great *Silva*. Now another manual of the trees has appeared, bearing the title *North American trees*, and written by BRITTON and SHAFER.<sup>6</sup> The very handsome volume is made bulky by the heavy paper, so that it will have to be used more as a standard dictionary than as a handy manual.

The distinct mission of the volume, however, is to present the trees in language so free from technical terminology, and by illustrations so characteristic, that they may be recognized by "any person of ordinary information." This will certainly meet and stimulate the growing interest in trees, a purpose that is worth while. The authors are in an exceptionally favorable position to make such a book accurate rather than merely popular, and it is a good thing now and then for men who have the facts to give to the public something that can be relied upon. The identification of trees should now be as easy as the long popular identification of birds. The characters are drawn from foliage, flowers, and fruit, and they are presented in the free style of ordinary description, rather than in the compact style of taxonomy. The illustrations are from excellent sketches and photographs, and really illustrate. The economic value of the various trees is included, so that when the name of a tree is discovered, the inquirer is in a position to obtain much useful and interesting information concerning it. Of course any definition of a tree must be arbitrary, but the authors have liberally included all species known to become trees in habit (with "single erect stem or trunk"), even if they are almost always shrubs.—J. M. C.

### MINOR NOTICES

**Physiology of stomata.**—LLOYD has given us a careful study of the behavior of the stomata in two desert plants, *Fouquieria splendens* and *Verbena ciliata*, made at the Desert Botanical Laboratory of the Carnegie Institution.<sup>7</sup> He addressed himself particularly to the question of the regulation of transpiration by stomatal movements, and furnishes conclusive evidence that the stomata in these plants, where there are no complications in the way of pits, plugs, or other contrivances, are not able to adjust the transpiration to the "needs" of the plants. Wide variation in the rate of transpiration is found, quite independent of the

<sup>5</sup> BOT. GAZETTE 39:301. 1905.

<sup>6</sup> BRITTON, NATHANIEL LORD, and SHAFER, JOHN ADOLPH, *North American trees*; being descriptions and illustrations of the trees growing independently of cultivation in North America, north of Mexico and the West Indies. Imp. 8vo. pp. x+894. figs. 781. New York: Henry Holt and Company. 1908. \$7.00.

<sup>7</sup> LLOYD, F. E., *The physiology of stomata*. Imp. 8vo. pp. 142. pls. 14. figs. 39. Washington: The Carnegie Institution, Publication 82. 1908.

position of the guard cells, the maximum diffusion capacity of the pore being seldom (if ever) utilized. A rhythmic variation in the transpiration rate was found to be independent of the stomatal rhythm. As to the latter, LLOYD finds that, aside from the indirect effect of high relative humidity in reducing the water loss and so favoring the opening of the stomata, there is no relation between the humidity and the position of the guard cells. He finds no closure of the stomata in anticipation of wilting, but during wilting a slow closure, without the preliminary opening attributed to them by FRANCIS DARWIN.

LLOYD also attacked an interesting problem in the supposed photosynthetic activity of the guard cells. He finds evidence of amyloplastic but none of chloroplastic activity, and concludes that the movements of the guard cells are related to their accumulation and dissolution of starch derived from the chlorenchyma, rather than to any photosynthetic products of the guard cells themselves.

This is a careful and thorough piece of work, highly creditable to the laboratory from which it comes. The experimental evidence is now at hand supporting conclusions which have been held by some physiologists for some years as highly probable on purely physical grounds.—C. R. B.

**The timbers of commerce.**—A second edition of BOULGER'S *Wood*, revised and enlarged, has appeared.<sup>8</sup> It deals with 1000 kinds of wood, and includes most of those known in general commerce. The first part (pp. 121) discusses wood in general, under such topics as origin, structure, development, classification, defects, selection, uses, supplies, and tests. The second part presents the woods of commerce, giving in each case the source, character, and use. The 48 plates are from photomicrographs of sections, and are intended to show the distinctive microscopic features. Such a book is encyclopedic, and therefore for its purpose it is extremely useful. The demand for a second edition speaks well for the favorable reception of the first.—J. M. C.

**Knuth's Handbook.**—The second volume of DAVIS' English translation of this encyclopedic work has just been issued by the Clarendon Press.<sup>9</sup> The original volumes and the first volume of the translation were reviewed in this journal,<sup>10</sup> so that the general scope and character of the work have been noted. The present volume includes observations on flower pollination made in Europe and in the arctic regions, and is a great mass of observations upon species ranging through the natural orders, from "Ranunculaceae to Stylidieae." Such a book cannot be reviewed, for it is an encyclopedia. It can only be announced, and

<sup>8</sup> BOULGER, G. S., *Wood*, a manual of the natural history and industrial applications of the timbers of commerce. 8vo. pp. xi+348. pls. 48. London: Edward Arnold. 1908. \$4.20.

<sup>9</sup> KNUTH, PAUL, *Handbook of flower pollination*. Translated by J. R. AINSWORTH DAVIS. Volume II. 8vo. pp. viii+703. figs. 210. Oxford: Clarendon Press. 1908. Half morocco 35s.; cloth 31s. 6d.

<sup>10</sup> BOT. GAZETTE 28:280. 1899; 28:432. 1899; 42:494. 1906.